IN THE DRAWINGS:

Figure 1 has been amended to show the signal processor 30 as including a digital recursive filter 31, on the Replacement Sheet attached hereto.

REMARKS

In the Office Action dated September 8, 2005, the drawings were objected to because the Examiner stated the recursive filter and the recursive digital filter respectively claimed in claims 3 and 4 must be shown in the drawings. Accordingly, Figure 1 has been amended to show the signal processor 30 as including a digital recursive filter 31, and reference numeral 31 has been used to designate the operation of the recursive digital filter at page 8 of the present specification. Since a recursive digital filter is clearly disclosed in the specification as originally filed, no new matter is added thereby.

Claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by Frola et al. This rejection is respectfully traversed for the following reasons.

In substantiating the rejection based on Frola, the Examiner simply repeated verbatim the language of claim 1, and provided a general indication to the abstract and Figure 4 of the Frola et al reference. The Frola et al reference was identified and discussed at pages 1 and 2 of the present specification. As indicated by equation (1) at the top of page 2 of the present specification, gas analyzers of the type disclosed in the Frola reference make use of a sensed temperature in the calculation of the acoustic velocity of sound in the gas being analyzed. As also discussed in the introductory portion of the present specification, it is a problem with gas analyzers of the type disclosed in the Frola reference that the temperature sensor has a time delay (probe time constant) associated therewith, which means that the output of the temperature sensor does not represent an instantaneous measurement of the "true" temperature. This is because the temperature sensor must reach an equilibrium condition and it is this equilibrium temperature that is

represented by the output signal from the temperature sensor. Unless the temperature remains constant for a long period of time, the output signal representing the equilibrium temperature will not be the actual temperature, because takes a certain amount of time when the actual temperature changes for the equilibrium state of the temperature sensor to "catch up" with the changed temperature.

The Frola et al reference does not recognize this problem, or at least provides no teachings to account for this problem. This is made clear from the equation given at column 6, line 60 of the Frola et al reference, wherein the temperature T appears twice. It is true that the second entry of the temperature T in this equation is preceded by a constant C_2, which is stated at column 7, lines 8-10 to be a function of the coil material and the temperature response characteristics of the transducers 12 and 13. The transducers 12 and 13, however, do not measure or sense temperature, but instead are used in the transmission/reception of ultrasonic energy. Therefore, although the signals from those ultrasound transducers may be adjusted, to a certain extent, to account for temperature characteristics of those transducers, this does not, and cannot, address the problem of a probe time constant associated with the measurement or sensing of the temperature itself.

Therefore, there is no disclosure whatsoever in the Frola reference of a signal processor that is supplied with the output from the temperature probe that produces a temporally-adapted output dependent on the probe time constant of the temperature probe, as set forth in claim 1 as originally filed. Nevertheless, claim 1 has been editorially amended consistent with the above discussion to make clear that the probe time constant causes the temperature measured by the temperature

probe to represent a temperature at a time does that does not coincide with the detection time at which the acoustic energy transmission through the gas is detected, and to make clear that the temporally-adapted output that is produced by the signal processor represents a temperature of the gas at the aforementioned detection time. Therefore, when the calculation unit determines compositional information of the gas from the temporally-adapted first output and the second output, the calculation unit is using a temperature that actually prevails at the time at which the transmission of the acoustic energy through the gas was detected.

The Frola et al reference, therefore, does not disclose all of the elements of claim 1 as arranged and operating in claim 1, and therefore does not anticipate claim 1.

Claims 2-4 were rejected under 35 U.S.C. §103(a) as being unpatentable over Frola et al in view of Gizatulin et al. This rejection is respectfully traversed as well, because from the above discussion it should be clear that even if the Examiner's statements regarding the teachings of the Gizatulin et al. reference were correct, modifying the Frola et al reference in view of the teachings of Gizatulin et al. still would not result in an acoustic gas analyzer as set forth in any of claims 2-4, all of which embody the subject matter of claim 1 therein.

Applicants respectfully submit, however, that the Examiner has not correctly interpreted the teachings of the Gizatulin et al. reference, which is only a short English abstract. Based on this abstract, it is true that the object of the system disclosed in the overall Gizatulin et al. reference is to avoid time delays in temperature measurements when switching a low-pass filter dependent on temperature. Quoting explicitly from the abstract, this object "is achieved by

introducing a pressure sensor (9)..." . The time constant of the pressure sensor (9) is much smaller than the time constant of a temperature sensor, and therefore the filter is controlled dependent on the output of the pressure sensor, *instead of* the output of the temperature sensor. The solution of the Gizatulin et al reference, therefore, is simply to avoid using a temperature sensor (temperature signal) at all, and instead to use a faster-responding signal, namely the signal from the pressure sensor.

This is an acceptable solution in the Gizatulin et al system because, as noted above, the signal in question is merely being used as a switching signal, and therefore whether it is derived from pressure sensing or derived from temperature sensing is immaterial (other than the aforementioned timing problem) to the purpose of switching the filter. This is not the case in the Frola et al reference wherein it is essential to have a signal representing a temperature measurement, so that a temperature value T is available for use in the aforementioned equation. If a pressure sensor were used instead of a temperature sensor, as taught by Gizatulin et al, no value for the temperature T would be available in the equation in Frola et al, and therefore the Frola system would be useless for its intended purpose. Modifying a reference that destroys its intended utility or purpose is not a permissible basis for substantiating a rejection under 35 U.S.C. §103(a).

Therefore, all claims of the application are submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,

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